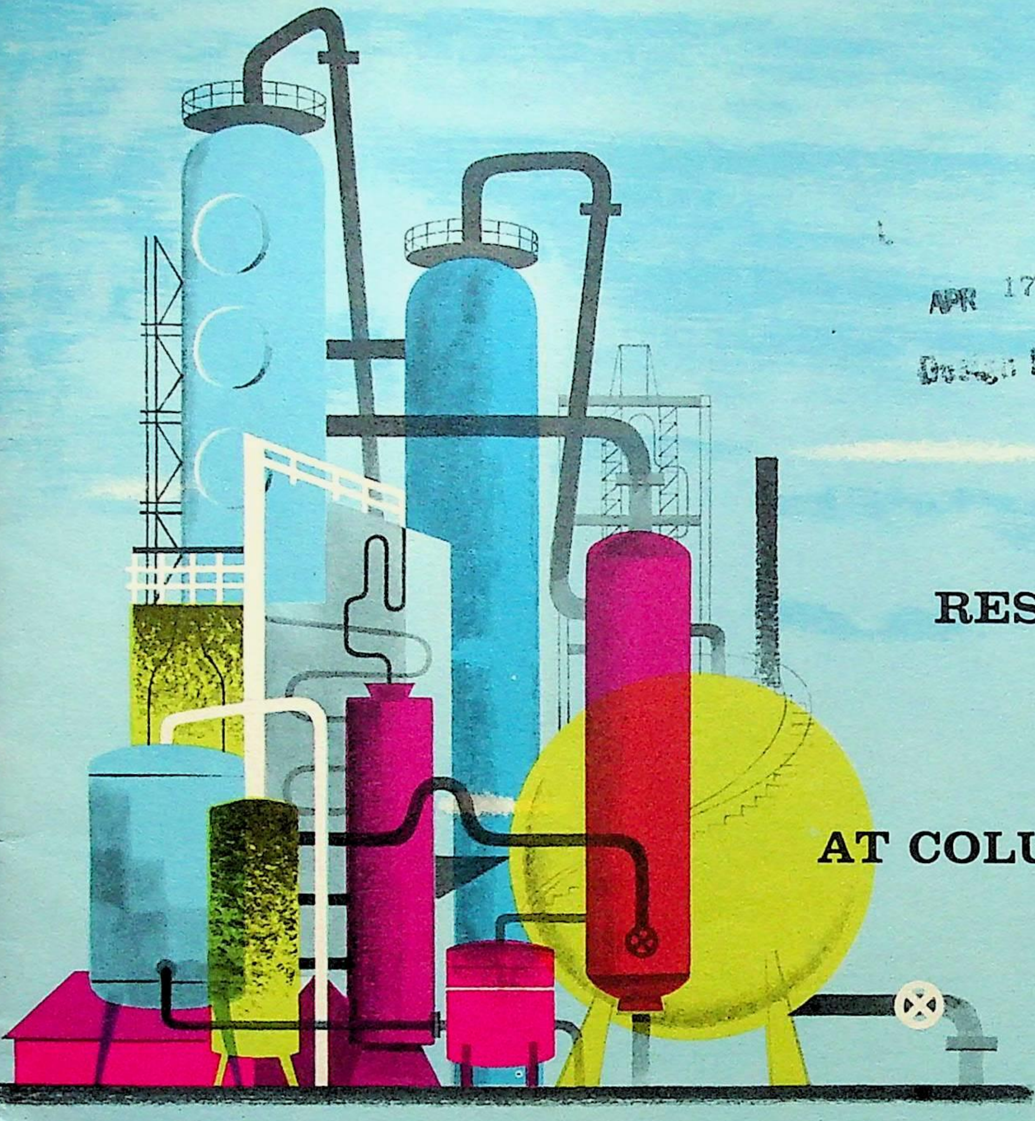
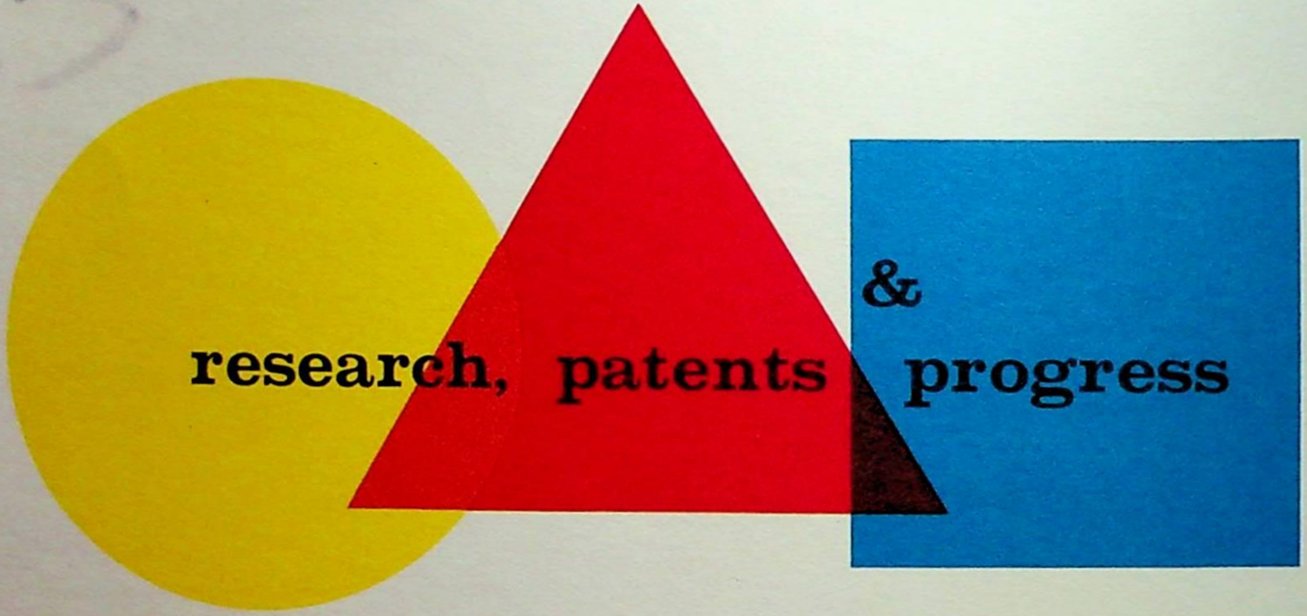


APR 17 1958
Design Division

C-~~34~~ 26

# RESEARCH, PATENTS AND PROGRESS AT COLUMBIA-SOUTHERN



# research, patents & progress

**COLUMBIA-SOUTHERN CHEMICAL CORPORATION**

*Subsidiary of Pittsburgh Plate Glass Company • Pittsburgh 22, Pa.*

GROWTH requires nourishment. Industrial growth is nourished by the application of new knowledge and new techniques developed through research. The fantastic growth of the chemical industry in recent years—at a rate much faster than that of American industry generally—is an example of what can be achieved by sustained research on a scale large enough to meet the need.

The relationship between research and progress is clear enough. But modern scientific research requires tremendous investments of time, money, and other resources. Each year, the Chemical Industry invests hundreds of millions of dollars in research and development activities.

By its very nature, research is a gamble; in exploring the unknown, one must sometimes follow trails that prove to be dead ends in order to be certain not to miss the path that leads to the goal. Much of the new knowledge gained, while it may be vital in the long run, may have no immediate economic value. In a free economy, then, what stimulates research?

Clearly, there must be some means of protecting the rights of the researcher when his efforts do lead to an invention of value. That need is met by the Patent System. Under that system, which was established by Congress in 1790, the inventor may be granted exclusive rights to his development for a period of 17 years. When the invention proves to be of value, the inventor is thus assured the opportunity to enjoy its rewards. At the end of the patent period, the invention becomes part of the public fund of knowledge. This protection of the inventor's investment of time, effort, and money during the term of the patent is the key to continuing investment in research. In the words of Abraham Lincoln, "The Patent System added the fuel of interest to the fire of genius."

Like the rest of the industry of which it is a part, Columbia-Southern conducts a vigorous and continuing program of research on many fronts. In the following pages, some of the recent achievements of this program, encouraged in part by the Patent System, are discussed. As the search for knowledge continues, one can only speculate about the new products and processes which will certainly follow.

# HI-SIL®

TOP QUALITY rubber products of any imaginable color are now so widely available that they are taken rather for granted. One of the most recent—and spectacular—developments in rubber technology is the colored tire. Although not yet in commercial production, it has been proven to be practical and serviceable.

Making colored rubber of good quality is not easy. As it is produced, rubber—either natural or synthetic—is not very tough. Before it can be used, strength must be added through reinforcement. The chemicals added to rubber to improve its physical properties are called *pigments*. For years, the standard reinforcing pigment was carbon black—and as a result, nearly all rubber products subject to severe wear were black.

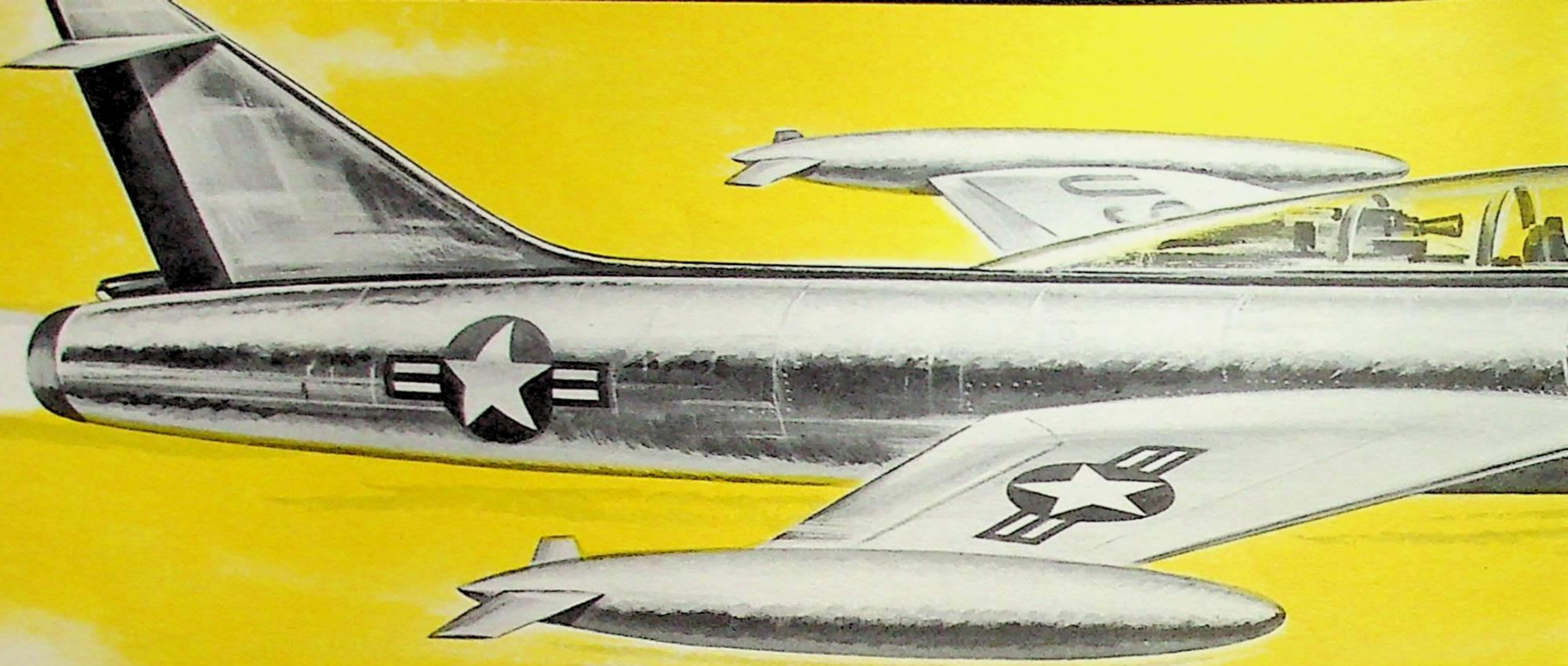
Columbia-Southern research led to the development of the white reinforcing pigments, Hi-Sil® and Silene®, which have made color and quality compatible in the rubber industry and in other industries.

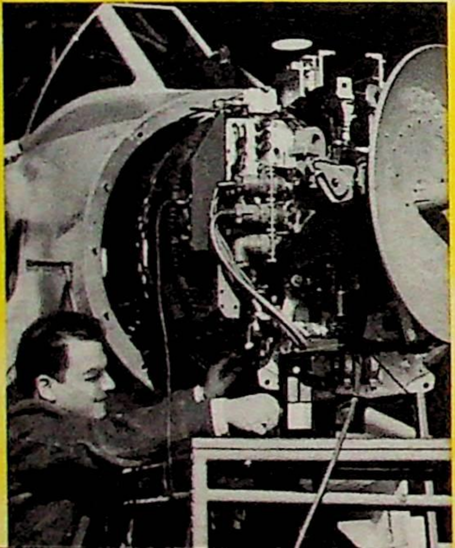
An important characteristic of reinforcing pigments is extremely small particle size. Hi-Sil, the most versatile of these, is made by a process which in effect chemically disintegrates sand to produce fine silica.

The production process and some techniques for using Hi-Sil, developed in Columbia-Southern laboratories, are protected by patents. The unusual properties of Hi-Sil enable it to impart strength to rubber rivaling that achieved with older reinforcing agents.

## Columbia-Southern key to bette

# rubber products

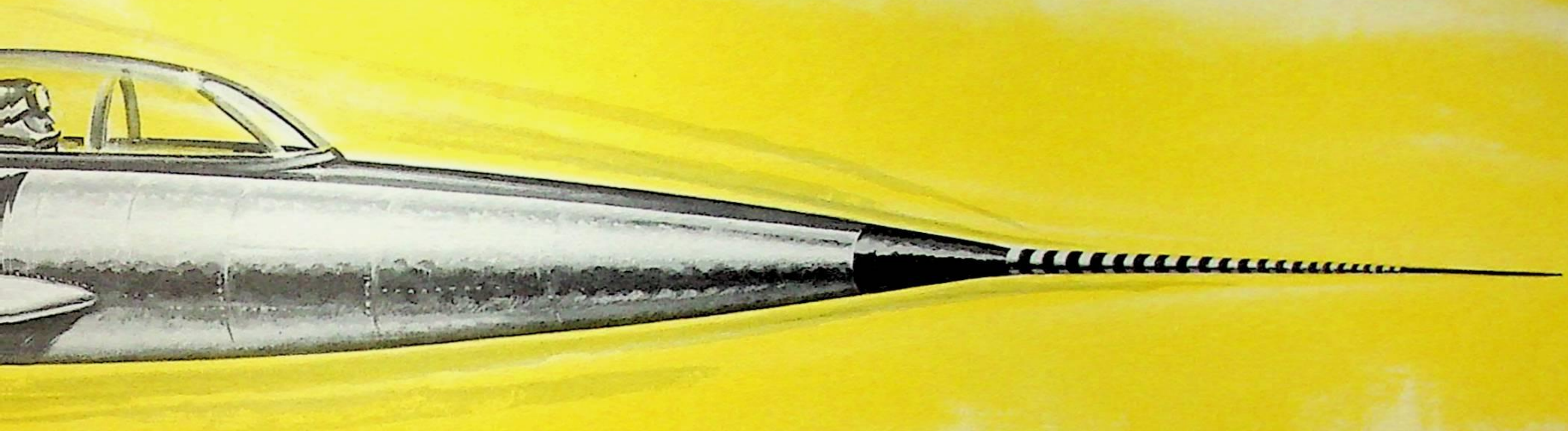




# Columbia-Southern

THE IMPORTANCE of a high level of industrial and technological development in our nation's defense effort cannot be overestimated. With so many frontiers of knowledge to be explored, it is a major source of strength that a private enterprise may make a good deal of progress on a particular problem before the national need is recognized.

As a leading producer of chlorine, Columbia-Southern naturally has a continuing interest in the development



# pioneering in NATIONAL DEFENSE

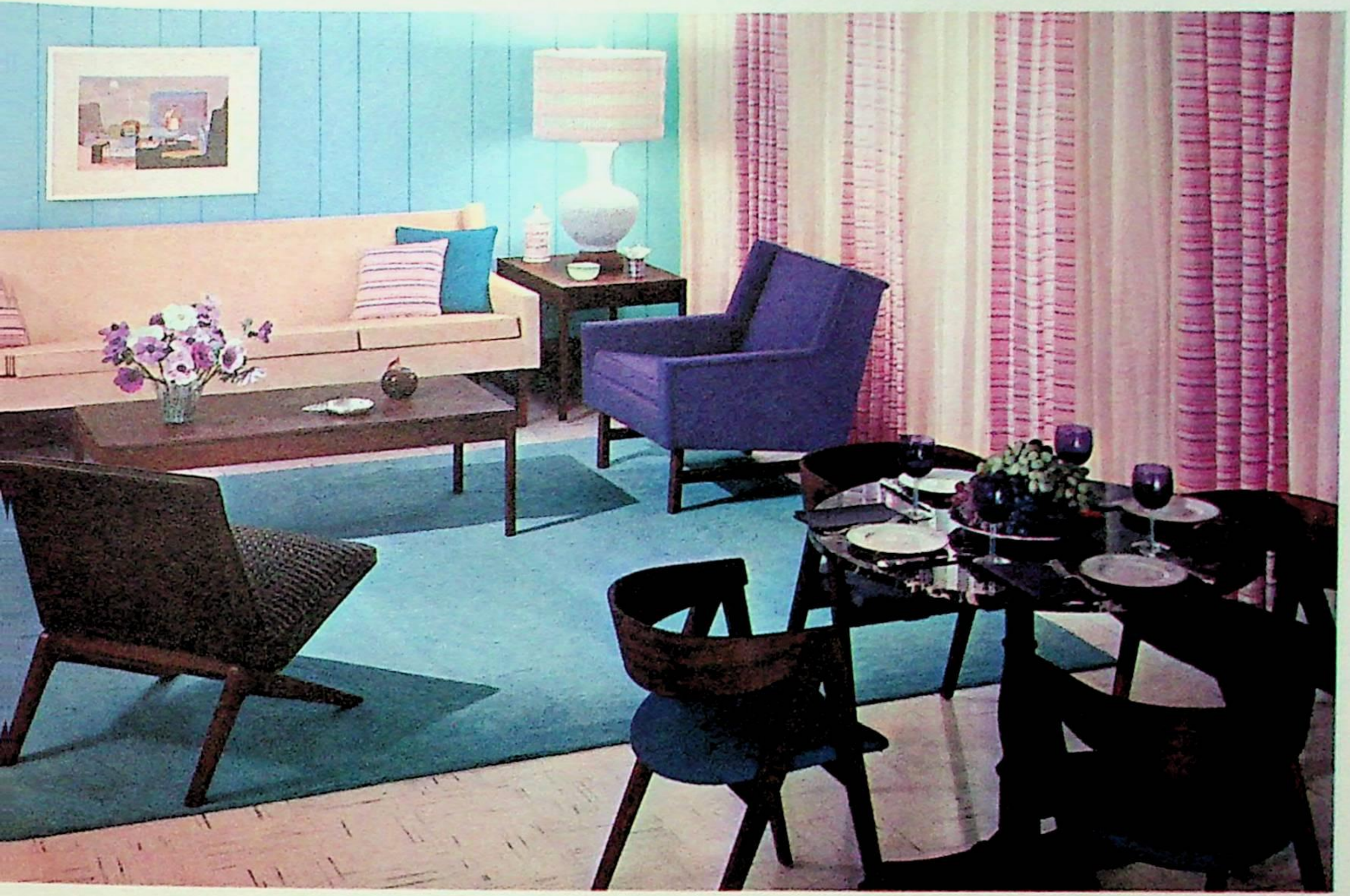
of ways to apply this versatile chemical to industrial problems. One of the results of this was the initiation, several years before World War II, of an extensive research program in the chlorination of metal ores. In the course of this research, an economical and practical method of producing titanium tetrachloride from titanium bearing ores was developed and patented.

With the development of the jet age, titanium metal suddenly assumed a place of critical importance in the defense program. The inventions which grew out of this early research effort constitute an important part of the presently used process for producing titanium. The significance of these contributions to the commercial development of this vital metal was recently recognized by an award for Chemical Engineering Achievement.

Continuing research in many areas will yield new knowledge that will add to our security in ways that we cannot even guess at now.

# Columbia-Southern research

AN IMPORTANT research goal for any manufacturer is improving the quality of his products to meet the requirements of his customers. One of the principal products of Columbia-Southern—caustic soda—is used extensively in the textile industry. Its biggest volume use is in the manufacturing of rayon—first and still by far the most widely used of the man-made fibers. Rayon manufacturing requires an exceptionally pure grade of caustic. Columbia-Southern developed a purification technique, known as the D-H Process, for refining commercial grade caustic soda to produce a grade able to meet the high standards of purity demanded by the rayon industry. This patented process has been used under Columbia-Southern licenses by the other major producers of caustic soda, to make the top quality material needed in the manufacture of fine rayon. With this premium quality material to work with, manufacturers have been able to keep on improving their product so that today's rayon is better and more versatile than ever.



## and MODERN TEXTILES

# Columbia-Southern research and AGRICULTURE

IN SPITE of all the dramatic advances being made in the more exotic branches of science, man is still more fundamentally dependent on agriculture than on any other skill. In the long battle to feed and clothe himself with products of the soil, he has been constantly harassed by weeds and insects. Now, chemistry is providing the tools to lick those problems.

Columbia-Southern products are used in some of the newer insecticides, such as DDT, that have been so successful in the fight against insect-borne disease and have substantially reduced crop losses due to insects.

Weeds, too, are about to yield to chemical treatment. Chloro IPC is a weed-killer manufactured by Columbia-Southern. In formulations developed and patented by Columbia-Southern, it has proved its ability to bring about substantial increases in the yield of cotton, rice, spinach and other crops. Much less farm labor is required when Chloro IPC is used, for it prevents weeds from ever getting started in crop rows, so that hand weeding is almost eliminated. And, without having to compete with weeds, crop plants grow much more vigorously, yield more generously.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION, a subsidiary of the Pittsburgh Plate Glass Company, is one of the country's oldest and largest producers of alkalies, chlorine, and related chemical products. The company serves a large and diversified group of customers whose products are vital to the welfare of our nation and play important parts in our way of life. Paper, glass, metals, food processing, agriculture, beverages, sanitation, chemicals, steel and other metals, rubber, and petroleum are among the industries that look to Columbia-Southern as a dependable supplier of materials they need.

Columbia-Southern plants are located at Barberton, Ohio; Natrium, West Virginia; Corpus Christi, Texas; Lake Charles, Louisiana; Jersey City, New Jersey; and Bartlett, California. Standard Chemical Limited, a Canadian subsidiary, operates a plant at Beauharnois, Quebec. Columbia-National Corporation, a subsidiary owned jointly with National Research Corporation, is building a plant, soon to be completed, near Pensacola, Florida, for the production of zirconium, a metal of considerable importance in the development of nuclear energy.

Recognizing the immediate and the long range importance of research and development, the company has recently completed a new, modern research center at its Barberton plant. Modern, well-equipped research facilities are also in operation at Natrium and Corpus Christi. In spacious, well-planned quarters, chemists, physicists, and engineers, aided by technicians and other trained assistants, find every tool they need for carrying on their important work. In these laboratories, the products and processes you have just read about, along with many others, were developed. Many projects now under way will yield equally interesting and important results in the future.

Columbia-Southern Executive Offices are in Pittsburgh, Pennsylvania; District Sales Offices are located in principal cities.

RETURN TO
DESIGN DIV.

**COLUMBIA-SOUTHERN CHEMICAL CORPORATION**

*Subsidiary of Pittsburgh Plate Glass Company • Pittsburgh 22, Pa.*

RETURN TO
DESIGN DIV.